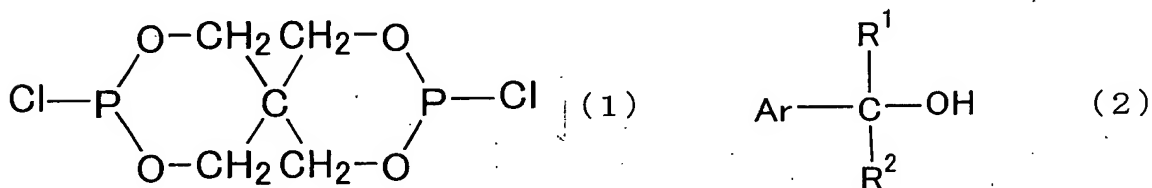
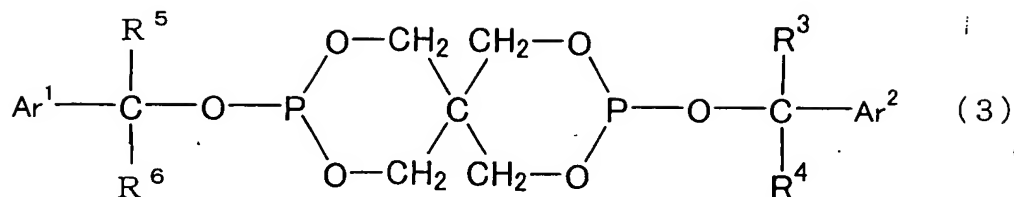


CLAIMS

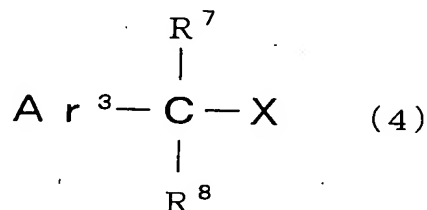
1. A process for producing a pentaerythritol diphosphonate represented by the formula (5) characterized by (A) reacting phosphorus trichloride with pentaerythritol in the presence of an inert solvent to obtain pentaerythritol dichlorophosphite represented by the formula (1) (reaction (a)), (B) reacting the pentaerythritol dichlorophosphite with an aralkyl alcohol represented by the formula (2) to obtain a pentaerythritol diphosphite represented by the formula (3) (reaction (b)), and (C) heat-treating the pentaerythritol diphosphite in the presence of a halogenated compound represented by the formula (4) on the condition of a temperature of from 80 to 300°C (reaction (c)):



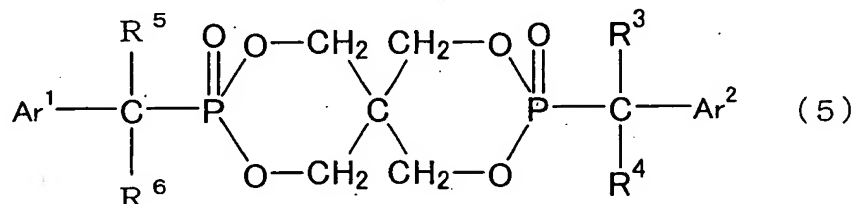
wherein Ar represents a substituted or unsubstituted aryl group having from 6 to 20 carbon atoms, and R¹ and R², which may be the same as or different from each other, each represents a hydrogen atom, a substituted or unsubstituted aryl group having from 6 to 20 carbon atoms, or a saturated or unsaturated hydrocarbon group having from 1 to 20 carbon atoms,



wherein Ar¹ and Ar², which may be the same as or different from each other, each represents a substituted or unsubstituted aryl group having from 6 to 20 carbon atoms, and R³, R⁴, R⁵ and R⁶, which may be the same as or different from each other, each represents a hydrogen atom, a substituted or unsubstituted aryl group having from 6 to 20 carbon atoms, or a saturated or unsaturated hydrocarbon group having from 1 to 20 carbon atoms,



wherein Ar³ represents a substituted or unsubstituted aryl group having from 6 to 20 carbon atoms, R⁷ and R⁸, which may be the same as or different from each other, each represents a hydrogen atom or a saturated or unsaturated hydrocarbon group having from 1 to 20 carbon atoms, and X represents a Br group,



wherein Ar¹ and Ar², which may be the same as or different from each other, each represents a substituted or unsubstituted aryl group having from 6 to 20 carbon atoms, and R³, R⁴, R⁵ and

R⁶, which may be the same as or different from each other, each represents a hydrogen atom, a substituted or unsubstituted aryl group having from 6 to 20 carbon atoms, or a saturated or unsaturated hydrocarbon group having from 1 to 20 carbon atoms.

2. The process for producing a pentaerythritol diphosphonate as described in claim 1, wherein the reaction (b) is effected in the presence of an organic base compound.

3. The process for producing a pentaerythritol diphosphonate as described in claim 2, wherein the organic base compound is used in an amount of from 180 to 400% by mole based on pentaerythritol in the reaction (b).

4. The process for producing a pentaerythritol diphosphonate as described in claim 2, wherein the organic base compound and a salt of the organic base compound (hereinafter, referred to as an organic base compound component) are isolated and removed from a reaction mixture containing the pentaerythritol diphosphite obtained in the reaction (b) to an exterior of a reaction system, and the pentaerythritol diphosphite, from which the organic base compound component has been removed, is used in the reaction (c).

5. The process for producing a pentaerythritol diphosphonate as described in claim 4, wherein the organic base compound component to be isolated and removed to the exterior of the reaction system described in claim 4 is 90% by mole or more per 100% by mole of the organic base compound used.

6. The process for producing a pentaerythritol diphosphonate as described in claim 4, wherein the pentaerythritol diphosphite is not isolated from a solution or a suspension liquid of the pentaerythritol diphosphite, from which the organic base compound component has been isolated and removed to the exterior of the reaction system, and is used in the subsequent reaction (c).

7. The process for producing a pentaerythritol diphosphonate as described in claim 1, wherein a solution or a suspension liquid of the pentaerythritol dichlorophosphite obtained in the reaction (a) is subjected to a heating treatment or a depressurizing treatment.

8. The process for producing a pentaerythritol diphosphonate as described in claim 1, wherein the pentaerythritol dichlorophosphite is not isolated from a solution or a suspension liquid of the pentaerythritol dichlorophosphite obtained in the reaction (a), and is used

in the subsequent reaction (b).

9. The process for producing a pentaerythritol diphosphonate as described in claim 1, wherein the inert solvent used in the reaction (a) is a solvent comprising one kind or two or more kinds selected from the group consisting of an aromatic hydrocarbon, an aliphatic hydrocarbon, a halogenated hydrocarbon and an oxygen atom-containing hydrocarbon.

10. The process for producing a pentaerythritol diphosphonate as described in claim 1, wherein in the reaction (a), phosphorous trichloride is used in an amount of from 195 to 240% by mole based on pentaerythritol.

11. The process for producing a pentaerythritol diphosphonate as described in claim 1, wherein the reaction (a) is effected in the presence of an organic base compound.

12. The process for producing a pentaerythritol diphosphonate as described in claim 1, wherein in the reaction (b), the aralkyl alcohol is used in an amount of from 180 to 250% by mole based on pentaerythritol.

13. The process for producing a pentaerythritol

diphosphonate as described in claim 1, wherein the halogenated compound used in the reaction (c) is benzyl bromide.

14. The process for producing a pentaerythritol diphosphonate as described in claim 1, wherein the halogenated compound used in the reaction (c) is benzyl bromide, and the benzyl bromide is used in an amount of from 1.5 to 3 mole per 1 mole of pentaerythritol.

15. The process for producing a pentaerythritol diphosphonate as described in claim 1, wherein the pentaerythritol diphosphonate represented by the formula (5) is a dibenzylpentaerythritol diphosphonate represented by the formula (5-a):

